NOAA Teacher at Sea
Karolyn Braun
Onboard NOAA Ship KA'IMIMOANA
October 6 – 28, 2006

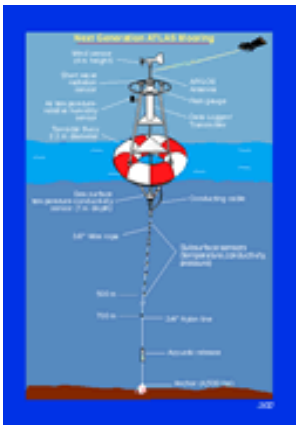
NOAA Teacher at Sea: **Karolyn Braun**
NOAA Ship KA'IMIMOANA
Mission: TAO Buoy Array Maintenance
Sunday, October 29, 2006

Plan of the Day
800 Repair TAO buoy 8N/International Date Line
Transit to Kwajalein, RMI

Chief Scientist, Patrick A'Hearn replaces a rain gauge and sea surface salinity sensor on a TAO buoy.

Today was our last TAO buoy of the cruise. I was able to go on the repair and assist the Chief Scientist, Patrick A'Hearn in a rain gauge and a sea surface salinity sensor replacement. Let's talk TAO buoys.

Development of the Tropical Atmosphere Ocean (TAO) array was motivated by the 1982-1983 El Nino event, the strongest of the century up to that time, which was neither predicted nor detected until nearly at its peak. The event highlighted the need for real-time data from the tropical Pacific for both monitoring, prediction, and improved understanding of El Nino. As a result, with support from NOAA's Equatorial Pacific Ocean Climate Studies (EPOCS) program, Pacific Marine Environmental Laboratory, (PMEL) began development of the ATLAS (Autonomous Temperature Line Acquisition System) mooring. This low-cost deep ocean mooring was designed to measure surface meteorological and subsurface oceanic parameters, and to transmit all data to shore in real-time via satellite relay. The mooring was also designed to last one year in the water before needing to be recovered for maintenance. In August of 1996, the KA'IMIMOANA was commissioned and dedicated to servicing the TAO array east of 165E.



The TAO surface buoy is a 2.3 m diameter fiberglass-over-foam toroid, with an aluminum tower and a stainless steel bridle. When completely rigged, the system has an air weight of approximately 660 kg, a net buoyancy of nearly 2300 kg, and an overall height of 4.9 m. The electronics tube is approximately 1.5 m long, 0.18 m diameter, and weighs 27 kg. The buoy can be seen on radar from 4-8 miles depending on sea conditions.

Moorings are deployed in water depths between 1500 and 6000m. To ensure that the upper section of the mooring is nearly vertical a nominal scope of 0.985 (ratio of mooring length to water depth) is employed on the moorings in water depths of 1800m or more.